Results from APA14 Coldbox Test

APA Consortium Meeting 10/28/24

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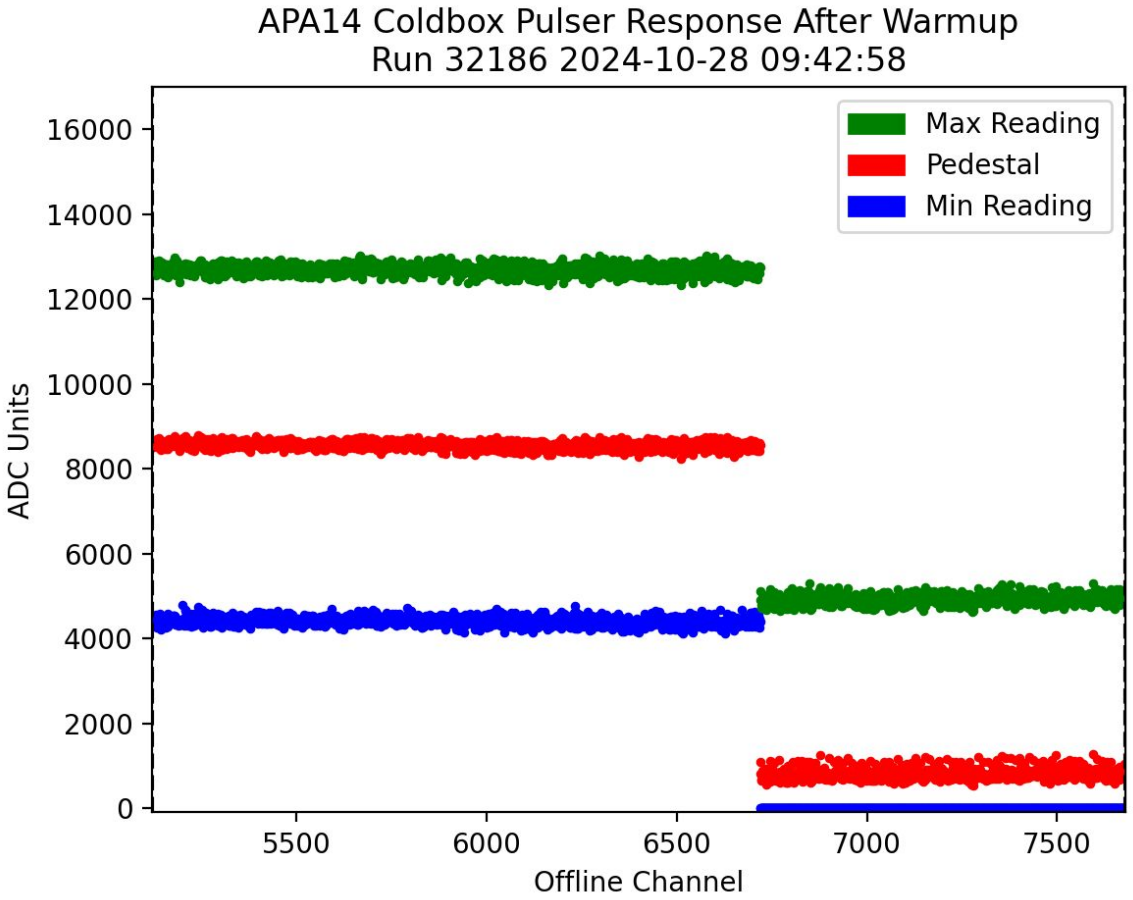
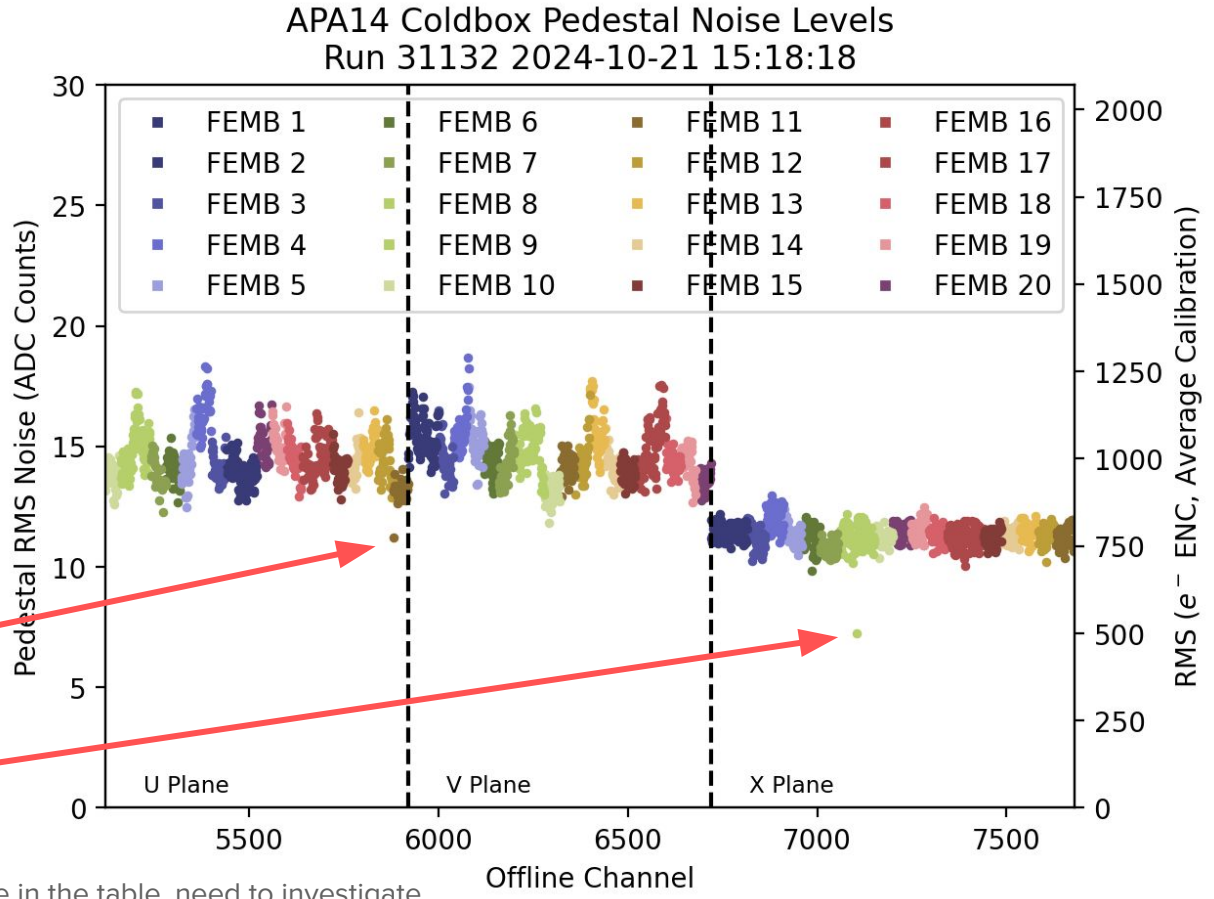
Pulser Checkouts

- As evaluated by pulser checkout tests, all electronics channels were alive and responsive throughout the whole test, from initial connection up to when we disconnected them



Initial Warm Results

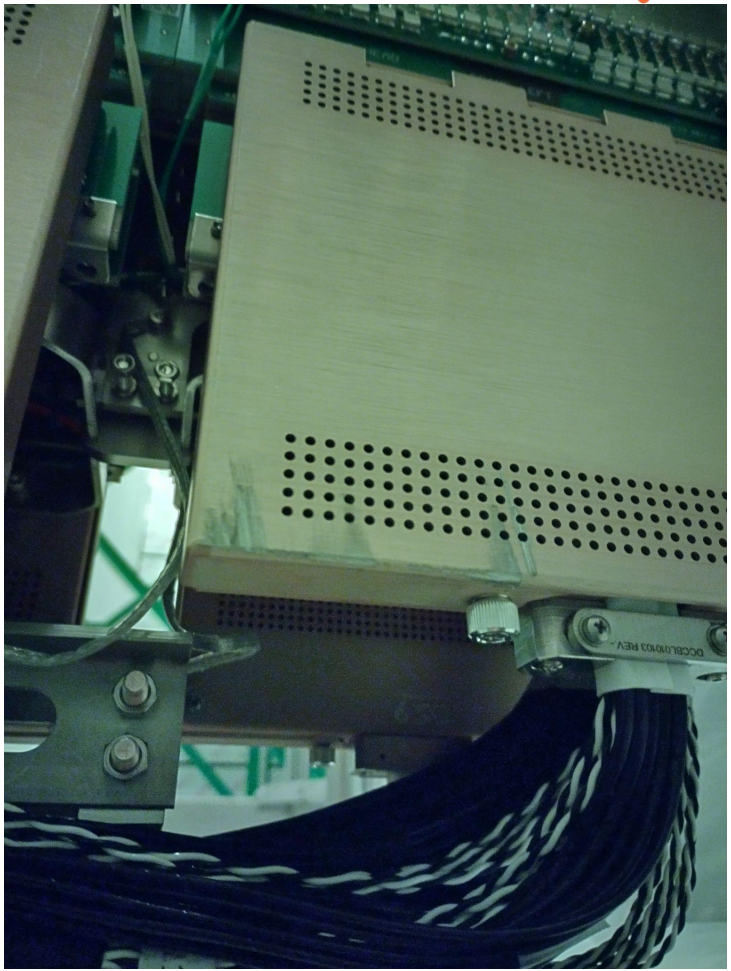
- Set of noise data taken right after the coldbox door was closed
- Results are right around what we expect
- Partially disconnected U wire (U761) matches the non-conformity report*
- Disconnected X wire (X386) is not recorded



*The FEMB numbering might not match what we have in the table, need to investigate

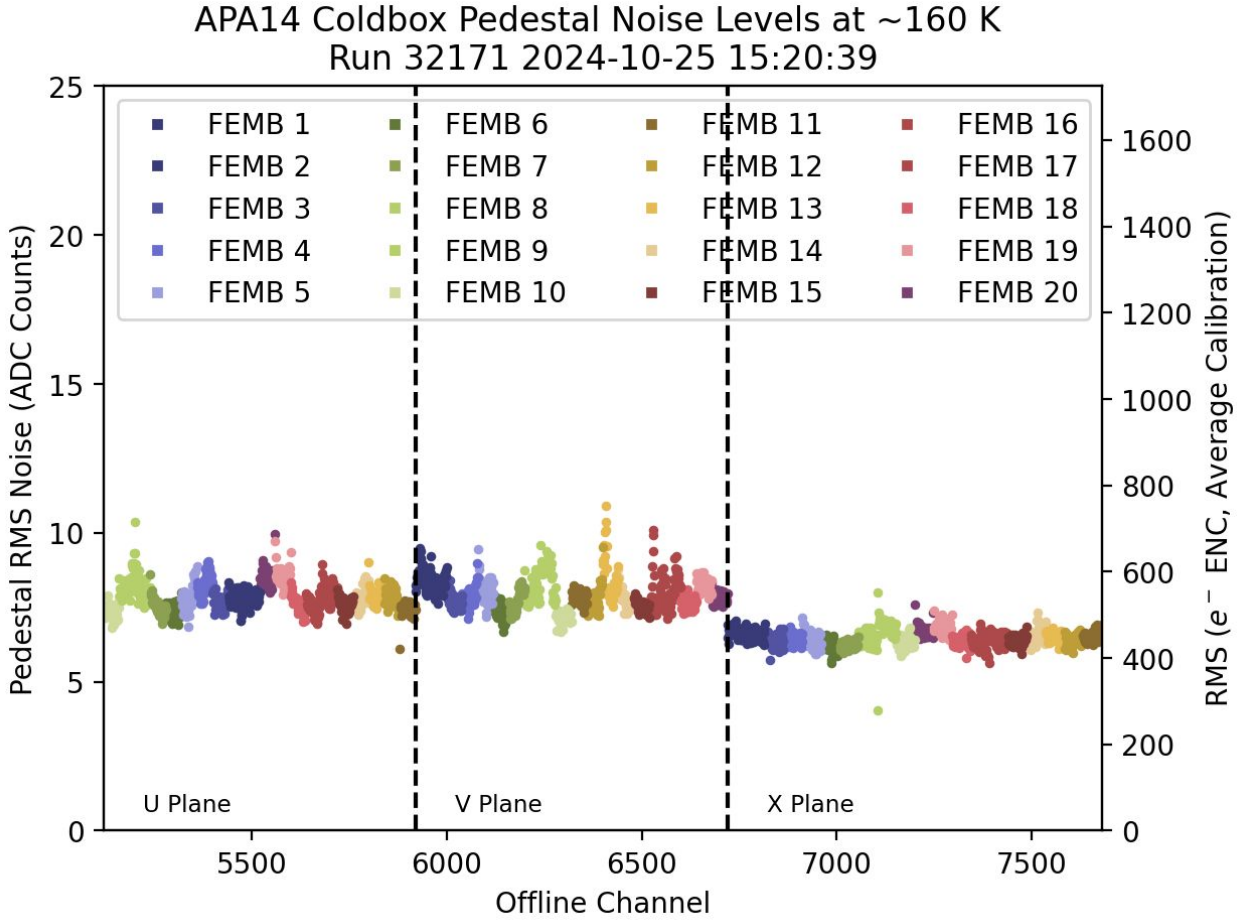
Disconnected X Channel

- The wire for the disconnected X channel visibly looks fine
- But it's on FEMB 11, which was the one which suffered mechanical disturbance when the APA was being pushed in
- Current guess: there's a broken connection somewhere between the wire and the FEMB - will investigate more during FEMB dismounting



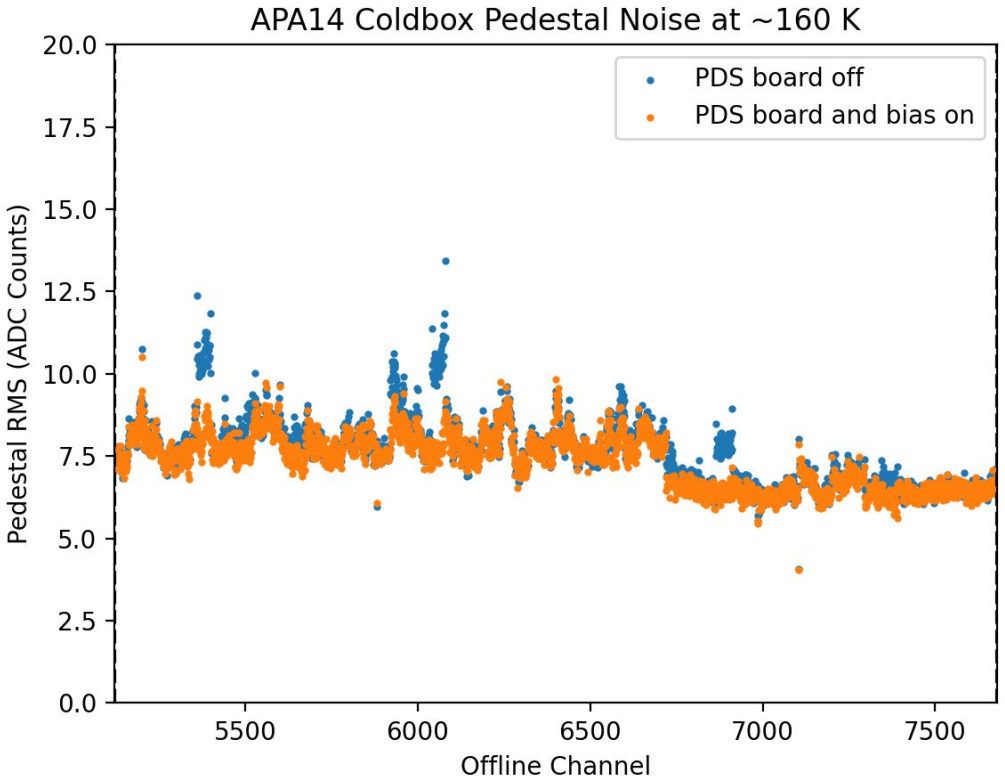
Cold Results

- Noise levels at cold (150-160 K) were as expected
- No new anomalies appearing at cold



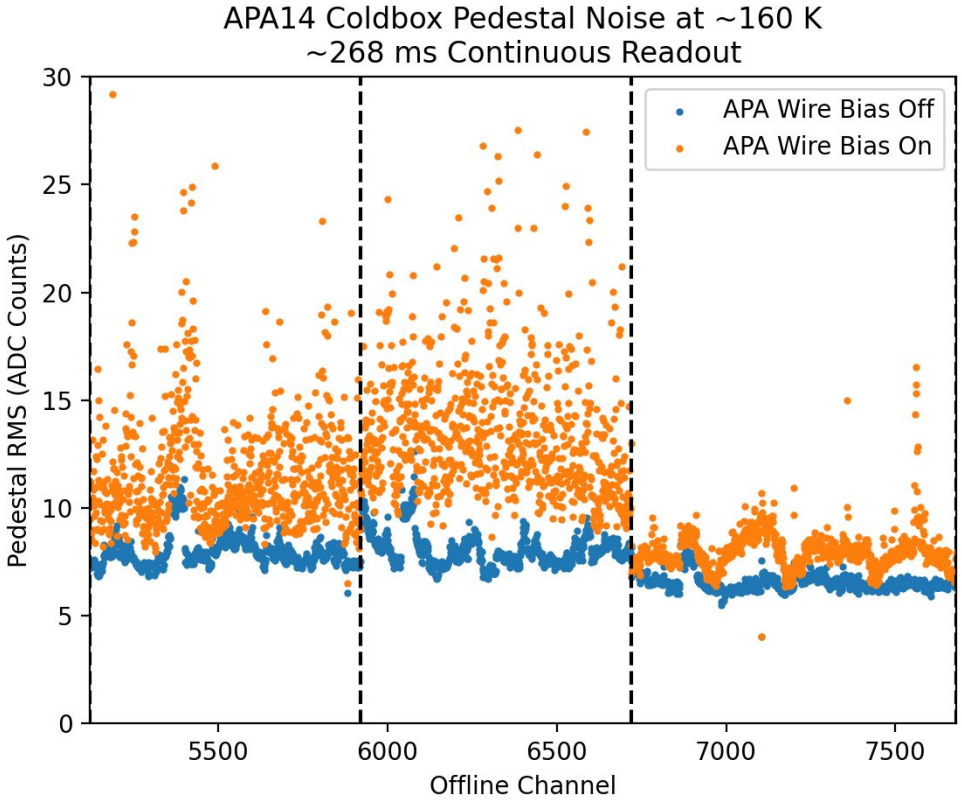
Noise Test with PDS

- There is one PD module installed in this APA
- We observe a small increase in noise when the board is connected but powered OFF
  - Still to be fully understood, but this isn't outrageous



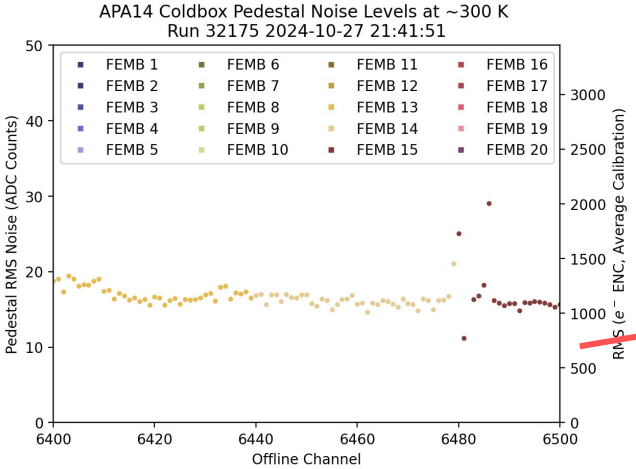
Wire Bias Test

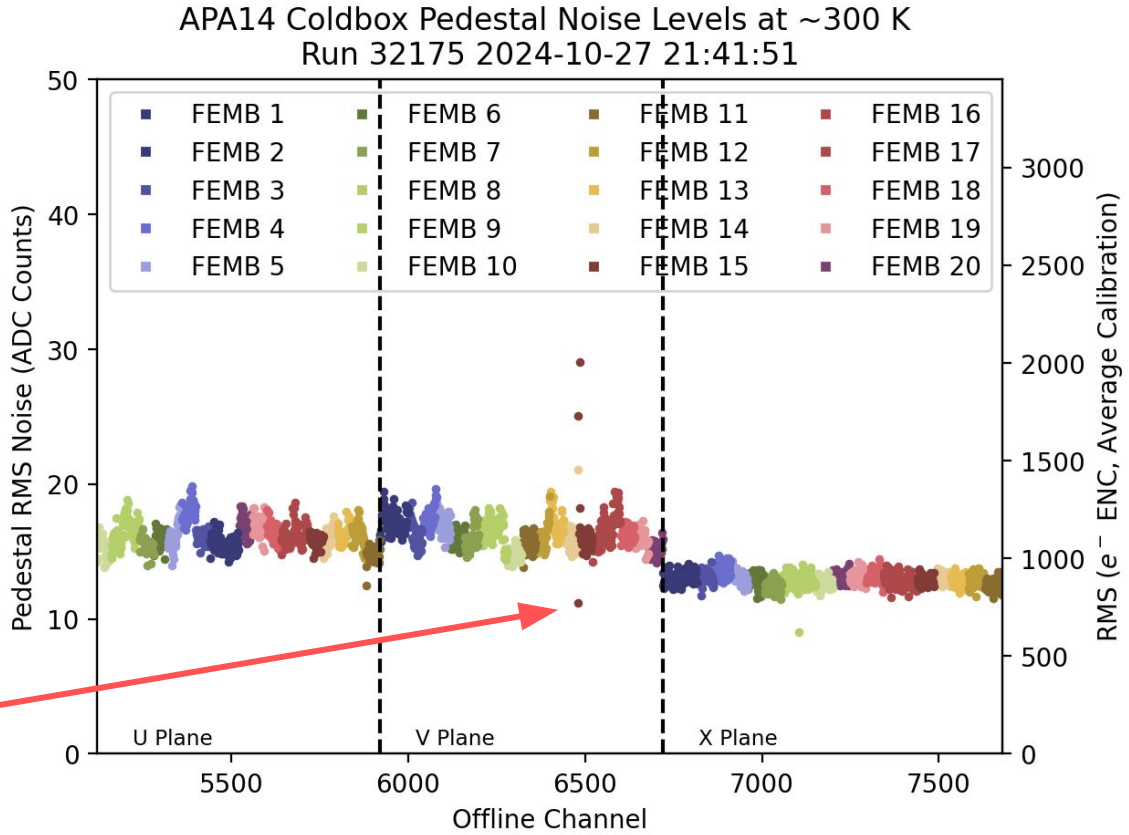
- Applied full wire bias (-665/-370/+820 V) and took data with a continuous 268 ms readout window
- Increased noise from low frequency oscillations is visible on all planes
- Current draw was 10 to 20 nA for X plane, 1 to 5 nA for U and G planes



Warmup Results

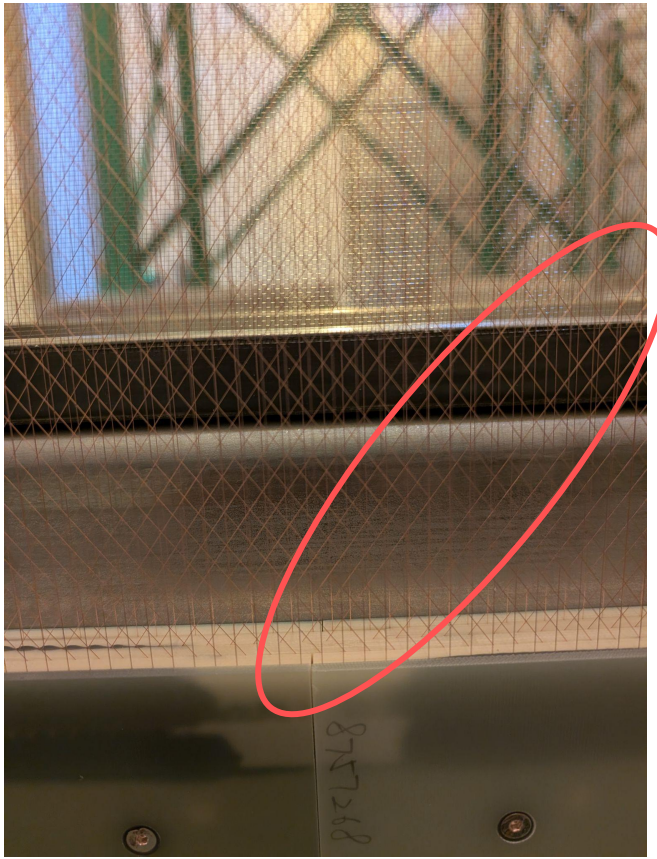
- At some point during warmup a V wire (V562) became disconnected
  - Still need to track down when exactly it happened





Broken Wire during Warmup

Upon removal from the coldbox, we visually identified a broken V wire in the expected location



Summary

- APA14 cold test results look good: no unexpected features from cooldown, wire bias behaved as expected, and everything passed our checklist
- There was one disconnected X channel from before the test for which we need to track down the source
  - In the location where the APA was bumped while moving into the coldbox
- One V wire broke during the warmup
  - No longer connected to the headboard